

# RESERVE COPY PATENT SPECIFICATION



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365,219

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## COMPLETE SPECIFICATION

### Improvements in Screw-thread Cutting Tools.

I, ALEXANDER DOIG CUNNINGHAM, of 19, Rutland Street, Kogarah, New South Wales, Australia, (British Subject), do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In the production of screw-thread cutting tools it has previously been proposed to provide on each land of the tool a series of uniformly-constructed polishing teeth, and a plurality of cutting teeth of uniform width gradually diminishing in depth towards the start end of the tool and having lateral cutting edges conforming in shape to the flanks of the screw thread to be cut and transverse cutting edges forming an acute angle with the axis of the shank of the tool. Such transverse cutting edges being created by bevelling the whole of the crest of each cutting tooth in one or other direction, or by making the whole of the tooth crest of "V" or "Λ" formation, so that the leading and rear flanks extend outwardly directly to the bevelled or inclined crests so produced. In a further construction it has been proposed to put the crests of internal screw-threads of a self-locking nut at a suitable inclination during formation of such threads on the nut by providing on each land of the screw-thread cutting tool a comparatively long inclined cutting tooth or surface in place of several of the larger cutting teeth, and to form the crest of the cutting teeth (which also are of uniform width and successively diminish in depth towards the start end of the tool) with "V" shaped recesses, such recesses diminishing in depth in each successive cutting tooth of the land from the start end of the tool. In this proposal, also, the leading and rear flanks of the cutting teeth extend outwardly to flat or substantially flat faces of the teeth and the "V" shaped recesses are created in intermediate portions only of the faces and have oppositely-sloping surfaces set at a uniform angle in relation to the axis of the tool.

The object of my invention is to provide  
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an improved tool whereby the screw-thread cutting operation may be facilitated and so that chattering is obviated and sharpness of the teeth retained to permit of greater output between sharpenings.

A screw-thread cutting tool according to my invention, is essentially characterised in that the cutting teeth gradually diminish in depth towards the start end of the tool and have flat or substantially flat crest portions with single or double chamfers formed on the flat crest portions of successive or alternate cutting teeth, such chamfers diminishing progressively towards the rear end of the tool and being created on said crest portions of the respective teeth by sloping rear or/and forward portions of the flat crests directed inwardly towards the rear or/and leading flanks of the cutting teeth.

In order that the invention may be more fully understood reference is now made to the accompanying drawings in which the details are exaggerated to clearly show the construction.

In said drawings:—

Fig. 1 is a diagrammatic elevation showing double chamfered cutting teeth on a land of a screw-cutting tap made in accordance with the invention, and Fig. 2 is an enlarged side elevation of one of the cutting teeth. Fig. 3 is a perspective view of a tooth with a single chamfer, and Fig. 4 is a similar view of a tooth chamfered in reverse direction to that shown in Fig. 3.

As shown in Fig. 1, the several polishing teeth 15 of each land of the tap are all of uniform size and spacing, whilst the cutting teeth 10 successively diminish in depth towards the start end of the tool and more-or-less merge into the shank at this end of the tool.

Said cutting teeth 10 have flat crest portions, as shown, each of which is created with a double chamfer 11 by sloping the rear and forward portions thereof inwardly towards the rear and leading flanks 10a, the depth of the chamfer being greatest in the front cutting tooth, as shown at 13, where it extends to the root line 12 of the teeth whilst the chamfer in

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the successive cutting teeth of the land diminishes progressively in depth—along the line 14—and vanishes before the first polishing tooth 15 is reached.

- 5 If the tap is to be used for the production of fine threads each cutting tooth 10 may be formed with a single chamfer 11, as indicated in Figs. 3 and 4, the cut following the eccentric curve 16 of the tooth. In the example shown in Fig. 3, the rear part 11 of the flat crest portion of the cutting tooth slopes inwardly towards the rear flank of the tooth, whilst in Fig. 4 the flat face or crest on the start side of the cutting tooth has been operated on so that it inclines inwardly in similar fashion towards the leading or forward flank of the tooth.

- 10 In Figs. 2 to 4, inclusive, the dotted lines 17 indicate the portions of the metal removed by the chamfering operation in the formation of the cutting teeth. In some cases, alternate cutting teeth only may be chamfered.

- 15 From the foregoing it will be apparent that there is reduction of the cutting area of the teeth that makes initial contact with the work thus giving an easy start and requiring only small power to operate the tool, and, in addition, all the cutting teeth at the start end of the tool, when in

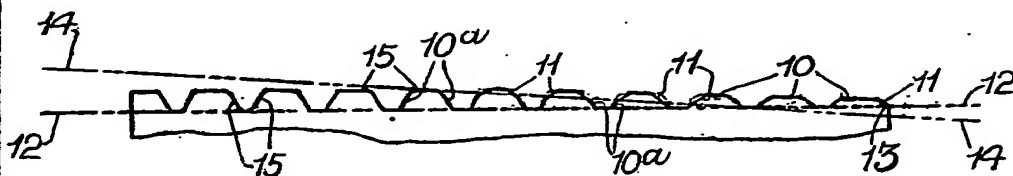
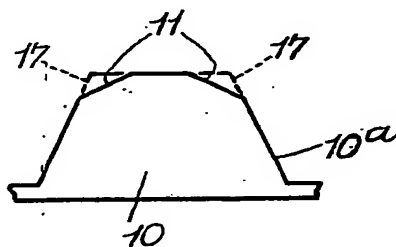
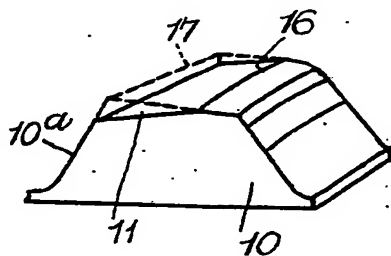
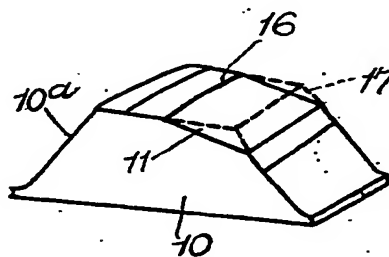
the work, are definitely in contact with a graded amount of the metal to be removed so that chattering is eliminated.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A screw-thread cutting tool which is characterised in that the cutting teeth gradually diminish in depth towards the start end of the tool and have flat or substantially flat crest portions with single or double chamfers formed on the flat crest portions of successive or alternate cutting teeth, such chamfers diminishing progressively towards the rear end of the tool and being created on said crest portions of the respective teeth by sloping rear or/and forward portions of the flat crests directed inwardly towards the rear or/and leading flanks of the cutting teeth.
2. A screw-thread cutting tool substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 27th day of October, 1930.  
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*Fig. 1.**Fig. 2.**Fig. 3.**Fig. 4.*

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[This Drawing is a reproduction of the Original on a reduced scale.]